## MAGGIORE ELECTRONIC LABORATORY

# <u>Hi Pro</u>

### OPERATING AND MAINTENANCE MANUAL



### Hi Pro PAU-2 POWER AMPLIFIER

1. **DESCRIPTION.** The PAU-2 is an RF power amplifier which produces an nominal power output of 15/20 watts, minimum, 20 watts max. with a input level of 2.5 watts. The amplifier covers the frequency range of 430/512 MHz and designed primarily as a booster amplifier for the Hi Pro EU-1 transmitter/exciter. Any exciter with a 50 ohm output, capable of meeting the drive and emission requirements, however, may be used.

The PA operates from a nominal 13.8 VDC source. Lower voltage can be used but it will reduce the power output of the amplifier. In most cases, a DC power supply is used with a battery back up system in times of AC power failure. Due to the efficiency of these power amplifiers it is practical to use a solar power system at remote sites.

The amplifier incorporates a single power transistor, in class C. An input network, provides a 50 ohm matching load and a means of coupling the exciter output to the amplifier. The input circuit is tuned by means of capacitor C1 & C2. The output of the amplifier is fed to the antenna through a low pass filter consisting of L3, C5, C6, C7 and C8.

- 2. <u>POWER AMPLIFIER ALIGNMENT.</u> Alignment requires the use of the following equipment:
  - 1. A 50 ohm non inductive load and wattmeter. (Preferably with a 5 watt and 30 watt scale).
  - 2. A 0-1 and 0-10 DC ampmeter connected in series with the supply line.
- **3.** <u>**PROCEDURE.**</u> Be sure that the driver is operating before attempting to tune the power amplifier. Terminate the driver stage into the 50 ohm inductive load wattmeter. Adjust the drive to approximately 2.5 watts. This is accomplished easily with the EU-1 transmitter by adjusting the power level pot located on the EU-1 transmitter board. Connect driver output to the power amplifier.

Adjust the power amplifier input capacitor C1 and C2 for an increase in power amplifier collector current.

Adjust C8, C6 and C5 for maximum current. Output power on the wattmeter/load should be indicated at this time. Adjust for maximum power output indication.

Alternately adjust all trim caps for maximum output indication on wattmeter.

4. <u>POWER AMPLIFIER INSTALLATION.</u> A heat sink of adequate size must be used with this amplifier. The pad on the power transistor must have heat sink compound applied to it and then this pad must be attached to an adequate heat sink. <u>Severe damage to the power transistor will result if operated without proper heat sinking.</u>

On amplifiers where a Hi Pro heat sink is provided with the amplifier, additional heat sinking is required in conjunction with the provided heat sink. This additional heat sinking is provided normally when mounted in our enclosure. If our enclosure is not used, then sandwich the amplifier and the heat sink to the chassis or panel.

#### 5. SUGGESTIONS ON HEAT SINK SIZES.

INTERMITTENT SERVICE: 20% DUTY CYCLE. 3"W x 5"L x 1" FINS.

#### Parts List

- C1 Variable Cap. 20 pf
- C2 Varable Cap. 20 pf
- C3 Disc Cap. 22 pf
- C4 Disc Cap 22 pf
- C5 Variable Cap 100 pf
- C6 Variable Cap 20 pf
- C7 Disc Cap 18 pf
- C8 Variable 18 pf
- C9 Elec. Cap 4.7 uf 16 VDC
- C10 Disc Cap 47 pf
- C11 Disc Cap 0.001 uf

- L1 9T #22 AWG 3/16 Dia.
- L2 Input Ind. Stripline
- L3 Output Ind. Stripline
- L4 Ferrite Choke
- Q1 Power Transistor MRF 641

Amplifier Dimensions: 1 3/4" W X 3 3/4" L





HI PRO UHF AMPLIFIER 430 510 MHz



RF OUT